**Waste Water Energy**

Malvia Rowe

Adapted Lesson Plan

Midterm

**Subject:** Mathematics

**Grade:** 7

**Topic:** Ratios and Proportions

**Mathematical Goals:**

Students will be able to

* Chose an appropriate strategy to solve proportions
* Recognize that ratios are representations of the relationship between quantities
* Distinguish between part-part and part-whole ratios and convert between the two when appropriate

**Common Core Mathematics Standard:**

7.RP. Analyze proportional relationships and use them to solve real world mathematical problems

Standards for Math Practice –

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.

**Teacher Competency:**

3c. Engage students in learning

**Vocabulary:**

Salinity – the saltiness or dissolved salt content of a body of water

**Materials:**

Salt

Water

Cup

Teaspoon

Jug

Salinity Monitor

**LAUNCH**

Background

Animals that live in salt marshes, mangroves, and swamps have built in adaptations to deal with salt water. Brine shrimp can be found in salt lakes and brine ponds. They thrive in conditions in which their predators cannot, such as high salt levels.

In order to raise brine shrimp in the classroom, we want to choose an aquarium that has the highest level of salinity. Which of the following mixtures have the highest salinity? Justify your answer.

MIX A

2 tablespoons of salt

3 cups of water

MIX C

3 table spoons of salt

4 cups of water

MIX B

1 tablespoon of salt

2 cups of water

MIX D

3 tablespoons of salt

5 cups of water

**EXPLORE**

In groups, students determine which sample of water has the highest salinity by comparing the ratios of salt to water. Then, construct an argument to support their reasoning.

**SUMMARIZE**

Students share out their responses, critiquing the rationale of their classmates and determine the effectiveness of using part-part or part-whole ratios. Then, using the salinity monitor, students will test each mixture of water to see if their arguments proved to be correct.

**RUBRIC FOR MATHEMATICAL EXPLORATIONS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **4** | **3** | **2** | **1** |
| **CONTRIBUTION TO GROUP WORK** | Consistently and  actively works  toward group goals;  willingly accepts  and fulfills  individual role  within group | Works toward  group goals without  occasional  prompting; accepts  and fulfills  individual role  within group | Works toward  group goals with  occasional  prompting | Works toward  group goals only  when prompted |
| **EMPATHY**  **(CONSIDERATION OF OTHERS)** | Shows sensitivity  to the feelings and  learning needs of  others; values the  knowledge,  opinion, and skills  of all group  members and  encourages their  contribution | Shows and  expresses  sensitivity to the  feelings of others;  encourages the  participation of  others | Shows sensitivity  to the feelings of  others | Needs occasional  reminders to be  sensitive to the  feelings of others |
| **CONTRIBUTION OF KNOWLEDGE** | Consistently and  actively contributes  knowledge,  opinions, and skills  without prompting  or reminding | Contributes  knowledge,  opinions, and skills  without prompting  or reminding | Contributes  information to the  group with  occasional  prompting or  reminding | Contributes  information to the  group only when  prompted |
| **WORKING AND SHARING WITH OTHERS** | Helps the group  identify necessary  changes and  encourages group  action for change;  always does the  assigned work  without having to  be reminded | Willingly  participates in  needed changes;  usually does the  assigned work and  rarely needs  reminding | Participates in  needed changes  with occasional  prompting; often  needs reminding to  do the assigned  work | Participates in  needed changes  when prompted and  encouraged; always  or often relies on  others to do the  work |